

Theseus Endurance Test

358 Hours' Running Completed to Date

INFORMATION has been released on an important and significant test run which is at present being undertaken by the Bristol Aeroplane Co. with one of their Theseus turboprop units. Several of these units are under active development for the Ministry of Supply, both for military and civil aircraft, and in January, 1948, both civil and military type approval was given following a 150-hour type test. As early as December, 1946, a 100-hour type test was passed at slightly lower power.

Instructions were given in January this year by Sir Alec Coryton, Controller of Supplies (Air), that attempts should be made to demonstrate that gas turbines require less maintenance than piston engines, and as a means of proving that such engines are reliable, extensive endurance tests were proposed. The Bristol Theseus is the first unit to attempt a "sealed" endurance run under the severe conditions laid down. The Air Registration Board have been co-opted to act as controlling authority and observers of the test. Conditions demanded are as follow:

(a) That the engine shall have completed the new 150-hour type test. (b) That the test run shall be of 250 hours' endurance made in seventeen non-stop cycles of 10 hours' duration and sixteen non-stop cycles of 5 hours' duration in a sealed hangar test bed. (c) The removal of parts of the engine for examination or repair during the test shall not be allowed, except as required for essential maintenance; and whatever maintenance is found necessary shall be recorded.

The engine has to be complete with accessories normally fitted in an aircraft installation, including a representative flight airscrew. Between the non-stop cycles the engine is stopped and allowed to cool down before restarting, in order that all heat stresses normally associated with operational use shall be experienced. In addition to take-off power, representative cruising powers varying from 70 to 55 per cent of take-off power, are included in the schedule.

The operating test started at 1.42 p.m. on June 19th and testing has continued day and night, and over weekends, at the rate of 20 hours per day up to the present time. A take-off power of 2,000 shaft horse-power plus 750 lb jet thrust, giving a total equivalent horse-power of 2,290 has

been maintained. As we go to press the remarkable time of 358½ hours has been completed. During this period it must be appreciated that no adjustments or even an inspection of any kind has been made to the engine. The 250-hour minimum target figure was completed at 1.30 p.m. on July 1st. The Bristol company also report that all temperatures and pressures are still normal and both engine and hangar are still clean. The fuel consumption, remarkably low for a gas turbine, remains steady. The figures are 0.65 lb/b.h.p./hr. at max. power calculated for a speed of 300 m.p.h. at 20,000ft. At 75 per cent power under similar conditions the figure is 0.70 lb/b.h.p./hr.

Some interesting general data concerning the first 250 hours of running follows:—(1) Total revolutions of the airscrew turbine wheel—113,000,000. (2) Distance traversed by each blade—5 times round the world. (3) Total amount of air consumed—12,000 tons, equivalent to 12,000 times the engine's own weight. (4) At 250 m.p.h. average speed an aircraft could have made the journey to New York and back 10 times over. (5) The total quantity of oil used in this period is 7 gallons, equivalent to a quarter of a pint per hour.

Recently a Theseus Lincoln flew to the Middle East in the hands of a Transport Command crew. Valuable operating experience in hot and abrasive atmospheres was obtained and the engine manufacturers regard the pilot's comment "The Theseus is just another engine to us," as a great compliment.

Theseus engines for the first Handley Page Hermes V are to be delivered shortly. At present icing problems are being closely studied. Ice guards have been designed and are operating successfully as also is a sheltered and heated air intake. Starting and a single-lever power (and pitch) control present no difficulty on the Theseus.

There are definite indications that original cost of manufacture and cost of overhaul will be at least as low as that of a piston engine of equivalent power providing equal numbers are considered. At present fewer than twenty Theseus units have been made. Maintenance costs are expected to be considerably less than for a large piston engine.

B.E.A. CRASH REPORT

AT 2100 hours on January 6th, 1948, B.E.A.C. Viking G-AHPK crashed into a ploughed field when attempting to land at Northolt airport. The pilot was killed and eight of the other occupants were injured. The aircraft was operating a scheduled passenger service between Renfrew and Northolt, and on arrival at destination the weather was such that an approach using S.B.A. was necessary. On arrival with a crew of four and fourteen passengers the Viking reported to Northolt Control that its position was five miles N.E. of the airport. Permission was given to land and two or three unsuccessful attempts to do so were made using the Beam system. About half an hour later the aircraft was heard flying low over the outskirts of Ruislip, after which it flew into some trees and crashed in a ploughed field 2½ miles N.N.W. of Northolt airport.

Captain W. H. Morton, the pilot, obtained his "A" licence in 1935, and his first "B" licence on July 5th, 1938. In September, 1947, he was appointed Flight Captain at Northolt in charge of the pilots operating B.E.A. internal services. His total flying hours were 6,520. It was noteworthy in the report from the Chief Inspector of Accidents that the instructor's record of Captain Morton's training showed he was prone to make mistakes in the S.B.A. procedure. It was recorded that he misread signals and in consequence turned in the wrong direction, thereby upsetting the approach. His flying records however showed that he had taken every opportunity in the air to practise Beam Approach.

The evidence showed that the pilot was given a QFE of 981 mbs when he arrived in the vicinity of Northolt airport

at 2031 hours. That was taken from the 2015 hours actual weather report. The Controller did not, however, inform the pilot of a change in the QFE to 980 mbs, as given in the 2045 hours weather report. The 1945, 2015 and 2045 hours actual weather reports had shown clearly that the barometric pressure was falling, and it had, in fact, dropped from 981.2 mbs to 980.1 mbs during the hour. The details of those reports was in the possession of the Control Officer, having been passed to him within a few minutes of their completion by the Meteorological Officer. The evidence also showed that for about five minutes before the accident the pilot had been "hugging" the airport at a low altitude.

Conclusions by the Chief Inspector of Accidents were that the pilot abandoned his attempts to land by the Beam and resorted to a visual or "timed" approach without informing the Controller, and that the accident was due to the aircraft flying into trees in conditions of poor visibility. The Inspector considered that the pilot committed an error of judgment in not asking for a diversion to another airport after he had failed to land by the aid of the Beam. At the same time an incorrect altimeter setting could not be dismissed as a possible contributory cause.

CHRISLEA PRODUCTION HOLD-UP

SHORTAGE of raw materials and components is given as the reason for a two-month close-down of the Clyst, Honiton, Exeter, works of the Chrislea Aircraft Co., makers of the Super Ace. Home and export orders will be affected.